

NASA ADVISORY COUNCIL  
National Aeronautics and Space Administration  
Washington, DC 20546  
Dr. Kenneth M. Ford, Chairman

November 18, 2010

Mr. Charles F. Bolden, Jr.  
Administrator  
National Aeronautics and Space Administration  
Washington, DC 20456

Dear Administrator Bolden:

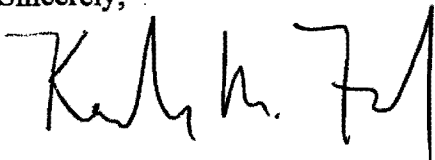
The NASA Advisory Council held a very productive public meeting at The AERO Institute in Palmdale, California, on October 6-7, 2010.

As a result of its deliberations, the Council approved five observations, one finding, and six recommendations at this meeting. In addition, the Council approved the *Final Report of the Ad-Hoc Task Force on Planetary Defense*. This concludes the activities of the Ad-Hoc Task Force.

The Council recommendations are enclosed for your consideration, along with the minutes from our meeting to provide additional background and context.

Thank you for the opportunity to provide our insights and advice concerning NASA and the U.S. civil space program. If you have any questions or wish to discuss further, please contact me.

Sincerely,

A handwritten signature in black ink, appearing to read 'Ken M. Ford', written in a cursive style.

Kenneth M. Ford  
Chairman

Enclosures

**Tracking Number: 2010-04-01 (AC-01)**  
**Verification and Validation (V&V) Project Planning**

**Observation:**

The Council believes that within the Verification & Validation (V&V) project planning, the scope is very broad and would benefit from a more focused approach. The Council suggests ARMD continue to engage the external V&V community to obtain suggestions for paring down the current research scope.

**Tracking Number: 2010-04-02 (AC-02)**  
**Data Mining Concepts for Aviation Research**

**Observation:**

The Council strongly endorses continued research in data mining concepts for aviation research. In particular, the Council recognizes the difficulty and importance of human factors research in collaboration with industry and other government agencies.

**Tracking Number: 2010-04-03 (AC-03)**  
**National Research Council Flight Research Study**

**Observation:**

The Council strongly endorses planned National Research Council flight research study that NASA is initiating with the NRC. The Aeronautics Committee should receive regular updates of the study's progress in order to provide continued advice on ARMD planning in regards to flight research.

**Tracking Number: 2010-04-05 (EC-01)**  
**Technology Development Collaboration**

**Recommendation:**

NASA should seek opportunities to collaborate on technology development with the Space leaders at the Department of Defense (DoD), the Air Force, and other agencies. In particular, the Administrator should brief the DoD "Partnership Council" [Secretary of the Air Force; Commander of Air Force Space Command; Commander of Strategic Command; and Director of the National Reconnaissance Office] on NASA's technology needs for space exploration and discuss opportunities to co-invest in complementary technology developments that can satisfy the common goals of reliable, affordable access to and thru space.

**Tracking Number: 2010-04-06 (EC-02)****Invite International Partners to Contribute to all Aspects of the Exploration Architecture****Recommendation:**

The NAC recommends that NASA pursue a policy that, considering the U.S. space industrial base and broad national security interests, invites potential partners to contribute to all aspects of the exploration architecture. In the exceptional case, where appropriate, partnerships on the critical path elements of the deep space transportation system should be considered.

**Tracking Number: 2010-04-07 (EC-03)****Developing Operability Incentives When Acquiring Commercial Crew Capabilities****Recommendation:**

NASA should develop operability incentives for the acquisition of commercial crew capabilities. These incentives should drive commercial partner design to include features resulting in recurring cost of operations low enough to attract other customers in addition to NASA.

**Tracking Number: 2010-04-08 (SC-01)****Modeling and Computational Capabilities****Observation:**

The Council has become aware of concerns in the space-science community that modeling and computational capabilities across space science disciplines within the Science Mission Directorate (SMD) may not be adequate to fully analyze data from NASA missions or carry out modeling and other computations, and advance scientific understanding, at a level and pace commensurate with the quality and quantity of returned data. The Science Committee plans to explore this potential issue in future meetings.

**Tracking Number: 2010-04-09 (SC-02)****Cost Containment of SMD Missions****Observation:**

The Council continues to receive information about SMD cost containment activities and independent reviews of various cost containment strategies. The Science Committee will continue to study this issue, having received a briefing from the Chair of the NRC's Study on "Controlling Cost Growth of NASA Earth and Space Science Missions" at its July 2010 meeting, and from the Executive Secretary of the NASA Chief Engineer's Management Operations

Working Group (MOWG) at its September telecon. NASA is working to complete its SMD mission cost study with The Aerospace Corporation at the end of 2010 or early 2011. The Science Committee is planning to review the results of that and other studies at future meetings.

**Tracking Number: 2010-04-10 (SC-03)**  
**NRC Cost Containment Study**

**Finding:**

The Council fully supports the excellent work reported in the NRC Study on Cost-Growth in NASA Earth and Space Science and notes that NASA is working diligently to consider its findings and recommendations.

**Tracking Number: 2010-04-11 (SC-04)**  
**Astro2010 Decadal Survey**

**Recommendation:**

**A. NASA's Implementation of Wide Field InfraRed Survey Telescope (WFIRST) mission**

- NASA should proceed with implementation of WFIRST as the top priority large space mission of Astro2010.
- NASA should solicit nominations for the WFIRST Science Definition Team (SDT) as soon as possible, including representatives of all three of WFIRST's science areas and members of ESA's Dark Energy Mission, Euclid. By Summer 2011, the SDT should complete a conceptual mission design that is mature enough to support NASA negotiations with ESA on a collaborative mission.

**B. NASA's role in ESA's Euclid Mission**

- NASA should keep open the option of a possible partnership with ESA on the Euclid mission.
- If Euclid is selected by ESA, NASA's goal should be the negotiation of a joint ESA/NASA program that meets the science goals of both the Euclid and WFIRST missions and is comprised of either a single combined mission or two complementary missions.

**C. NASA's role in ESA's PLANetary Transits and Oscillations of stars (PLATO), Mission**

- NASA should inform ESA that NASA will not seek a strategic partnership on PLATO, since its science investigation was not recommended in the Decadal Survey.

**Tracking Number: 2010-04-12 (SOC-01)**  
**Verifying and Certifying Commercial Crew Spacecraft**

**Recommendation:**

NASA should expedite development of a strategy, plan and a team for defining and obtaining objective data which would indicate that a commercial vehicle is adequately verified, certified and tested to meet requirements. This strategy and plan should be part of the solicitation package. The plan should identify the analytical and test data, including flight test required, and NASA's involvement in the development activity to enable informed participation in reviews to ascertain that the requirements have been met. The NAC also suggests that part of the strategy should be a small technical team(s) with representatives from all critical disciplines, including flight crew personnel, to following the development of the vehicle and operations development. These teams should be limited in size and operate under guidelines defined in "the plan." These team(s) should cover all the bases, and should be staffed with specific named participants.

**Tracking Number: 2010-04-13 (SOC-02)**  
**Sharing NASA "Know-How" with Commercial Developers**

**Recommendation:**

The NAC recommends that the impressive NASA capabilities and background available at the Human Spaceflight Centers be offered to the bidders of the commercial crew vehicle. A mechanism can be set up to share this know-how in the most efficient and useful way, to expedite development and safe operation of commercial spacecraft.